

**DRAFT FINAL  
EXPANDED ENGINEERING EVALUATION/COST ANALYSIS (EEE/CA)  
FOR THE  
McLAREN TAILINGS SITE  
COOKE CITY, MONTANA**

Engineering Services Agreement DEQ/MWCB 401027  
Task Order Number 05

**Prepared for:**

Mr. John Koerth  
Montana Department of Environmental Quality  
Mine Waste Cleanup Bureau  
P. O. Box 200901  
Helena, Montana 59620

**Prepared by:**

Pioneer Technical Services, Inc.  
P.O. Box 3445  
Butte, Montana 59702

**May 2002**

## 1.0 INTRODUCTION

This Expanded Engineering Evaluation/Cost Analysis (EEE/CA) was prepared for the Montana Department of Environmental Quality/Mine Waste Cleanup Bureau (DEQ/MWCB) by Pioneer Technical Services, Inc. (Pioneer) under Engineering Services Agreement DEQ/MWCB 401027, Task Order Number 05.

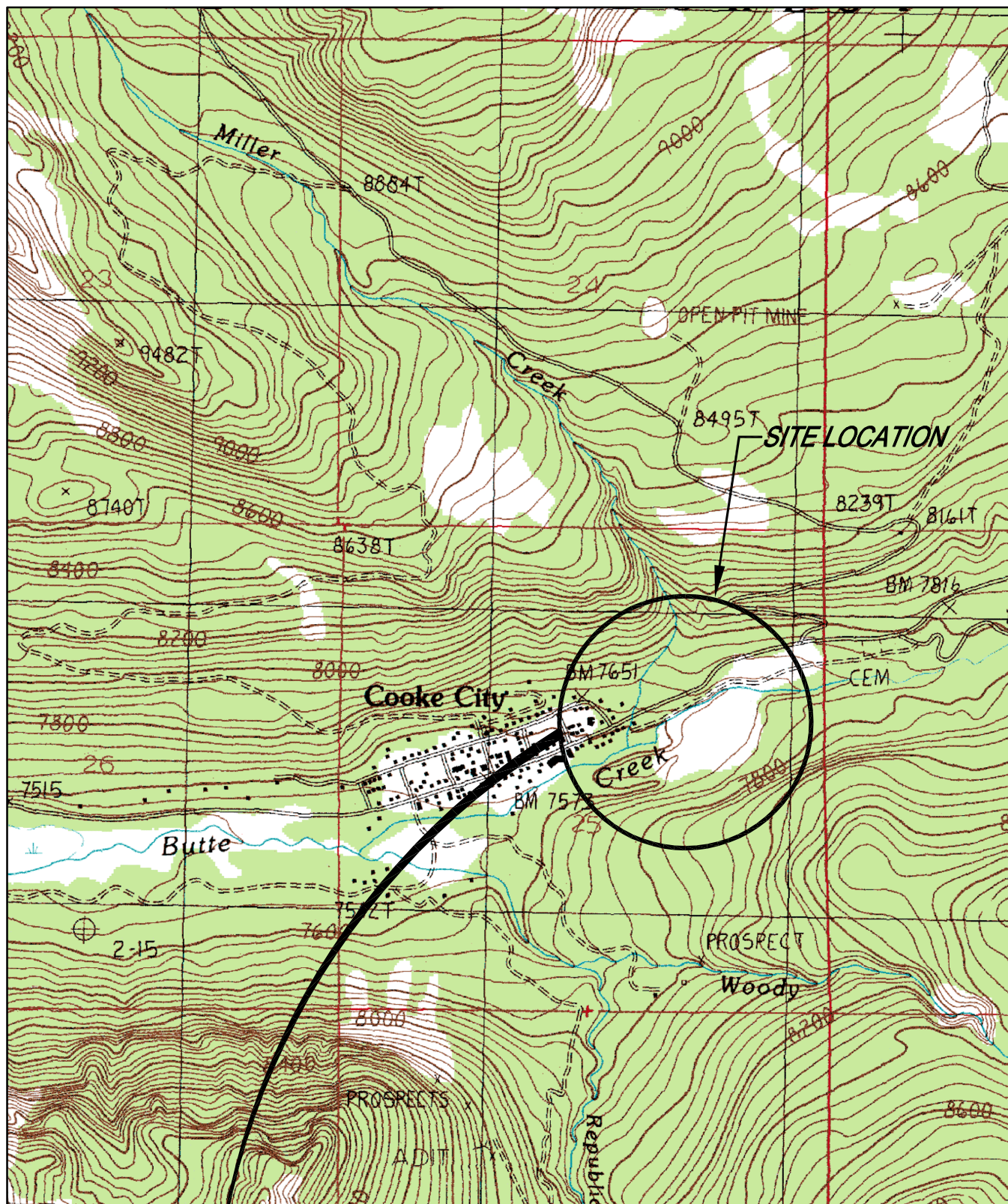
The primary purpose of this report is to present the detailed analysis of reclamation alternatives for the McLaren Tailings Site in accordance with the National Contingency Plan (NCP). Additionally, the site background, waste characteristics, applicable or relevant and appropriate requirements (ARARs), risk assessment, and preliminary development and screening of reclamation alternatives are presented herein. The purpose of providing this supplemental information with the detailed analysis of alternatives is to give the reviewers and risk managers a comprehensive “stand-alone” decision making tool.

The McLaren Tailings Site is an abandoned hardrock mine/mill site ranked Number 130 on the DEQ/MWCB (formally the Department of State Lands/Abandoned Mine Reclamation Bureau [DSL/AMRB]) Priority Sites List. This document presents the EEE/CA for the reclamation of abandoned tailings and waste rock currently located at the McLaren Tailings Site. Some of the data used for this evaluation was presented in the document “*Site Evaluation Report for the McLaren Tailings Site*” prepared by Pioneer and submitted to the DEQ/MWCB in March 2001.

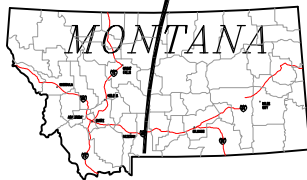
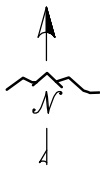
The McLaren Tailings Site is located in Park County in Section 25 of Township 9 South, Range 14 East of the Montana Principle Meridian (see Figure 1-1). The site is accessed by traveling approximately ¼ mile east of Cooke City, Montana, along Highway 212 and turning south onto a dirt road that exits the highway. The site is located less than 500 feet south of the highway and encompasses an area of roughly 20 acres (see Figure 1-2).

The McLaren Tailings Site was designated an Emergency Response Action Site by the U.S. Environmental Protection Agency (EPA) Region VIII in 1988. At this time, the Kennecott Corporation (identified Potentially Responsible Party [PRP]) elected to perform the corrective actions at the site itself, in lieu of having the U.S. Department of Interior Bureau of Reclamation (BOR) perform the work. The proposed remediation plan included: 1) construction of an earthen berm to reinforce the existing tailings dam; 2) removal of tailings from the toe of the existing tailings dam and replacement with clean fill material; 3) construction of an open interceptor drain along the southern perimeter of the site; and 4) seeding of all disturbed areas. Construction activities began on September 4, 1998 and were completed by September 24, 1990 (BOR, 1994).

In March 1991, the BOR evaluated the effectiveness of Kennecott’s stability actions. The results of the analysis concluded the dam was only “marginally stable.” Kennecott was directed by the EPA to conduct additional construction activities of the site, which included: 1) installing a perforated plastic drainpipe within the prism of the open interceptor drain along the southern perimeter of the site; 2) installing a filter along the toe of the tailings dam and placement of buttress fill; 3) dewatering the dam toe to facilitate construction operations; 4) operating a bulldozer parallel to the slope of the dam to enhance reseeding operations; 5) filling in some of the exploration holes remaining in the tailings cover; and 6) leveling the slope over the toe drain in the area where a seep occurs to encourage water to flow into the drain. All activities were



MC-EECA-113.DWG



SOURCE: COOKE CITY, MONTANA-WYOMING  
7.5 QUADRANGLE

FIGURE 1-1  
SITE LOCATION MAP,  
McLAREN TAILINGS  
SITE

SCALE: 1"=1500'  
DATE: 5/13/02



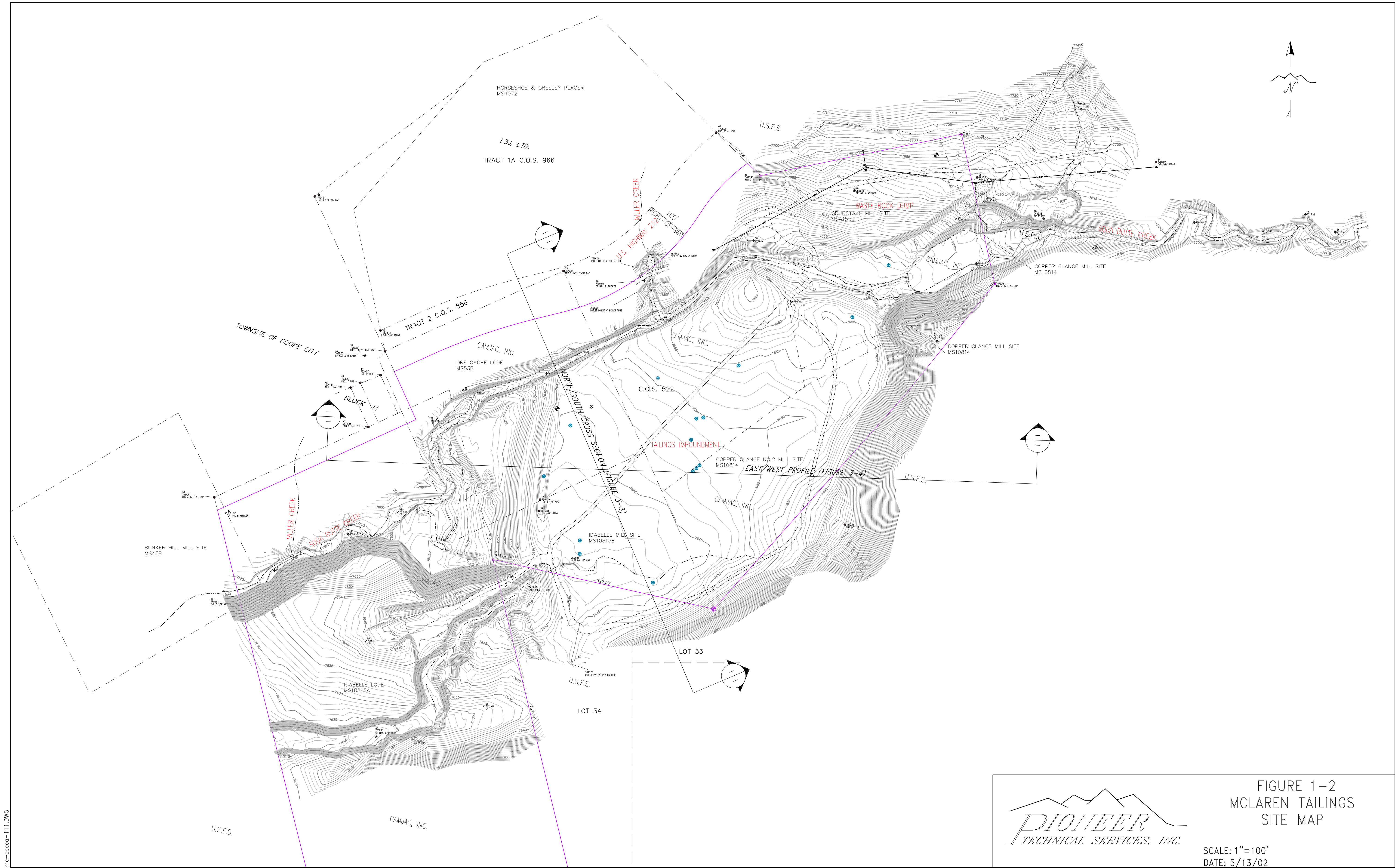


FIGURE 1-2  
MCLAREN TAILINGS  
SITE MAP

SCALE: 1"=100'  
DATE: 5/13/02



completed by August 22, 1991 (BOR, 1994).

On August 10, 1993, a site investigation was completed at the McLaren Tailings Site (PA# 34-004) by Pioneer for the DSL/AMRB as part of a state-wide abandoned mine inventory project. During this investigation, samples of waste rock, tailings, groundwater, surface water, sediment, and background soils were collected. Upon scoring this site using the DEQ/MWCB Abandoned and Inactive Mines Scoring System (AIMSS), the resulting rank was #130 of 278 on the DEQ/MWCB list.

*A Response Action Report for the McLaren Tailings Site, Cooke City, Montana* (BOR, 1994) was prepared by BOR in 1994. This report summarized response actions that were undertaken by the EPA, Region VIII, Emergency Response Branch at the McLaren Tailings Site. These actions were undertaken by the EPA in response to a request for technical assistance by the National Park Service, the U. S. Forest Service (Gallatin National Forest), and the U.S. Fish and Wildlife Service.

The report concluded the following:

- The toe drain below the tailings dam appears to have increased the stability of the embankment; however, random “quick” conditions can still be generated along the toe when the groundwater levels are high. The toe of the embankment appears much more stable than in the past. Surface erosion is scouring the face of the tailings dam because reseeding efforts have been only marginally successful.
- The subsurface drain pipe located along the southern boundary of the tailings area intercepts some surface water and diverts it away from the tailings; however, it is suspected that partial plugging of the geotextile is preventing the drain from performing at its optimum capacity.
- The emergency dike located on the eastern edge of the site continues to provide protection from flooding of Soda Butte Creek.
- The original creek channel of Soda Butte Creek (located beneath the tailings footprint) continues to contribute flow to the tailings.
- Miller Creek likely continues to contribute subsurface flow into the tailings.
- A significant portion of the site is void of vegetative ground cover.
- The effluent from the drains below the McLaren Tailings Dam discharge directly into Soda Butte Creek.

On September 20 and 21, 2000, under contract with DEQ/MWCB, Pioneer conducted a limited site investigation at the McLaren Tailings Site, which included collecting surface water, sediment, and tailings samples. Results of this investigation are included in the *Site Evaluation Report for the McLaren Tailings Site*. (DEQ/MWCB-Pioneer, 2001a). On September 17 through 20, 2001, Pioneer conducted a geotechnical investigation at the site, which included installing and sampling multiple boreholes in the tailings area and multiple backhoe test pits in the waste

rock dump, and potential borrow/repository areas. Information from this investigation is presented in greater detail in Section 3.0 of this document.

## 1.1 REPORT ORGANIZATION

This EEE/CA is organized into 11 sections. The contents of each section are briefly described in the following paragraphs:

**SECTION 2.0 BACKGROUND** - presents a background description of the McLaren Tailings Site. Background sections include: a detailed history of past mining and milling activities; geologic, hydrologic, and climatic characteristics of the site; the biological setting, such as the wildlife and fisheries resources and the vegetation indigenous to the area; and threatened and endangered species concerns; as well as the cultural setting issues, such as present and future land uses, are described in this section.

**SECTION 3.0 WASTE CHARACTERISTICS AND SUMMARY OF RECLAMATION INVESTIGATION** – describes the characteristics of the wastes present at the site, including waste types, volume estimates, and contaminant concentrations, as well as an evaluation of existing data derived from previous response actions or investigations.

**SECTION 4.0 SUMMARY OF THE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS** – presents the Montana State and Federal government requirements which are considered ARARs for the reclamation effort. Requirements discussed in this section are chemical-, location-, and action-specific in nature.

**SECTION 5.0 SUMMARY OF THE RISK ASSESSMENT** – presents a summary of the risk assessment performed for the site. Contaminant sources, routes of exposure, and receptors are evaluated to determine the relative threats posed by each source within the project boundary and each exposure pathway.

**SECTION 6.0 RECLAMATION OBJECTIVES AND GOALS** – presents the reclamation objectives and applicable clean up standards.

**SECTION 7.0 DEVELOPMENT AND SCREENING OF RECLAMATION ALTERNATIVES** – preliminarily identifies and screens potentially applicable reclamation alternatives. Reclamation alternatives are evaluated based on effectiveness, implementability, and cost.

**SECTION 8.0 DETAILED ANALYSIS OF RECLAMATION ALTERNATIVES** – presents the detailed analysis of reclamation alternatives pertaining to the seven NCP evaluation criteria.

**SECTION 9.0 COMPARATIVE ANALYSIS OF RECLAMATION ALTERNATIVES** – presents a comparative analysis of the reclamation alternatives consistent with the NCP.

**SECTION 10.0 PREFERRED ALTERNATIVE** – presents the recommended preferred alternative and summarizes the reasoning behind choosing this alternative.

**SECTION 11.0 REFERENCES** - lists the references cited in the text.